
Effects of Type of Ownership of Skilled Nursing Facilities on Residents' Mortality Rates in Illinois

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Synopsis

The effect of ownership on the quality and cost of care in skilled nursing facilities (SNFs) was examined using unadjusted and adjusted mortality rates for such facilities in Illinois for the 1986–87 reporting year. Results indicated that when using unadjusted mortality rates, for-profit facilities had much lower rates than either government-owned or nonprofit SNFs. When mortality rates were adjusted, using available measures of intervening variables, differences by type of ownership disappeared. The higher percentage of discharges to general hospitals exhibited by for-profit facilities, compared with other types of facility ownership, appears to have the strongest effect on SNF mortality rates.

CHANGES in the demographic characteristics of the U.S. population show that a steadily increasing proportion of our elderly population is at risk of being institutionalized.

As skilled nursing facility (SNF) care grows in economic and social importance, concerns mount in the public, government, and industry sectors of the economy about the quality, availability, and financing of that care. Part of the concern stems from perceived differences in the delivery of SNF care by proprietary and nonproprietary facilities (1–3).

Of about 18,000 SNFs in the United States, 75 percent are for-profit, 20 percent are nonprofit, and the remainder are government-owned (4). The effects of ownership patterns on the quality and the costs of care provided have concerned researchers and policy makers alike (2, 3).

Greene and Monahan (5) have argued that type of ownership is an important predictor of the quality of care provided by SNFs. Specifically, they found that for-profit facilities provide lower quality care than nonprofit facilities, attributing that to the profit motive. One recurring question is whether profit-motivated organizations seek to maximize profits by providing a better product than their competitors, or whether they do this by cutting costs through reductions in the quality of care. Greene and Monahan (5) however, note mixed results from studies of the relationships between ownership and quality.

Although some attention has been paid to the general issue of quality of care, little specific empirical research has been reported on mortality rates in the SNF industry. Zimmer noted that mortality is a useful outcome

measure of quality (6). As the numbers of SNFs, SNF beds, and potential residents increase, we should expect more people to die in SNFs. This expectation is supported by Ingram and Barry, who noted that SNF mortality doubled during the '60s (7). Thus, the issue of mortality rates according to the type of facility ownership is of considerable interest to policy makers.

As Medicare and Medicaid move toward becoming fixed rate reimbursement systems (5), mortality rates have the potential for becoming a more important indicator of the quality of care than is now the case. In theory, fixed reimbursement systems provide a mechanism for controlling and predicting expenditures in the SNF industry. A major problem associated with this form of reimbursement system, however, is that, in order to maximize revenues in a for-profit facility or to develop surplus financial resources in a nonprofit facility, the quality of care provided residents may have to be reduced (5). Hence, examining mortality rates in SNFs, as an indicator of the quality of care provided, assumes increased importance.

Ordinarily, one would expect little or no difference between mortality rates of for-profit and nonprofit SNFs. Most research on the effects of ownership on quality of care has been focused on the differences between for-profit and the nonprofit facilities. Government-owned facilities are presumably grouped with other forms of nonprofit ownership (5). The problem of maximizing profit, or surplus financial resources, does not appear to apply to government-owned facilities. Although one might expect mortality rates for government-owned SNFs to be lower than those for either of the other two types of ownership, this is not the case,

Table 1. Means and standard deviations of variables used in study of skilled nursing facilities in Illinois, 1986–87, shown by type of ownership

Variable	Government owned (N = 38)		Nonprofit (N = 171)		For profit (N = 294)		All SNFs (N = 503)	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Mortality rate per 100 per year	113.79	77.55	113.11	62.53	9.81	65.34	11.22	67.40
Percent female	170.44	13.64	73.90	16.60	70.82	21.28	71.84	19.32
Percent nonwhite	12.57	9.11	13.14	11.72	10.62	21.52	7.49	18.36
Percent Medicaid	¹ 243.41	32.19	125.77	27.30	55.82	33.78	44.79	34.52
Percent 85 years and older	233.02	18.67	142.70	23.01	32.20	23.25	35.85	23.33
Percent discharges to general hospital	118.62	18.12	122.41	20.57	44.99	26.43	35.47	26.68
Percent serious diagnoses	57.00	14.61	52.61	16.80	52.42	15.59	52.81	15.95
Number of SNF beds set up	2110.79	116.77	172.29	55.40	102.93	71.93	93.18	72.65

¹Significantly different from for-profits beyond the 0.05 level. ²Significantly different from nonprofits beyond the 0.05 level.

probably because they serve a sicker and more indigent population.

When examining mortality as an outcome measure of quality of care in SNFs, adjusting for important intervening variables is necessary to obtain a more accurate picture of the phenomenon (6). We expected there would be no differences in SNF mortality rates by type of ownership, after organizational characteristics and characteristics of residents were controlled. The hypothesis we tested was that the adjusted mortality rates for government-owned, nonprofit, and for-profit SNFs did not differ significantly.

Data and Methods

The data used in this research included all SNFs in the State and came from the 1986–87 Illinois Department of Public Health Long-Term Care Facility Survey. A completed questionnaire is required to be submitted each year for each licensed SNF. Among the 943 respondents, 509 facilities provided skilled care. The analyses reported in this paper were based on 503 SNFs, excluding 6 SNFs that provided incomplete data on key elements.

Of the SNFs included in the analysis, 38 were government-owned, 171 were nonprofits, and 294 were for-profits. The percent of facilities located in metropolitan areas was significantly lower for government-owned (42.1 percent) than either not-for-profits (62.2 percent) or for-profit SNFs (64.1 percent).

Survey information collected from each facility included residents' age, sex, and racial-ethnic distributions; primary diagnoses; the daily rate charged by the facility and bed utilization; and other factors. The dependent variable was the facility's mortality rate measured as the number of deaths per 100 residents during the year. The main independent variable of interest was the type of ownership.

We selected different measures from the question-

naire to serve as control variables in the analyses because there was considerable variation in the composition of the SNFs. The variables used in the analysis were the residents' race-ethnicity, sex, and severity of diagnosis; type of payment; and a measure of facility size. To indicate the demographic characteristics of the facility, we used the percentage of residents who were female, the percentage nonwhite, and the percentage 85 years of age or older. We used the percentage of residents who were Medicaid patients to control for socioeconomic status. The number of SNF beds was used as an indicator of facility size.

To control for discharge patterns, we used the percentage of all discharges to general hospitals during the reporting period. We believed this statistic to be important to control for when examining mortality because some SNFs may discharge terminally ill residents rather than treat them. Earlier analyses indicated that for-profit facilities were discharging significantly higher percentages of their patients to hospitals than either government-owned facilities or nonprofits.

As a proxy for the severity of cases within facilities, we used a percentage of all primary diagnoses we considered to be of a potentially serious nature. For a proxy measure of the severity of the diagnosis, we used percentage of all primary diagnoses reported by the facility that were in one of the six categories of neoplasms, endocrine or metabolic diseases, blood diseases, circulatory system diseases, respiratory diseases, and injuries or poisonings.

The correlation between the two variables was low ($r = -0.04$), indicating that they have independent effects on the outcome measure.

Methodology

The methodologic strategy was, first, to examine gross differences in study variables within each category of facility ownership. This provided basic infor-

mation on facility characteristics to be used in interpreting the overall results of the analysis.

Second, we used a multivariate approach, based on a general linear model, to control for differences in facility composition in examining the net effects of type of ownership on mortality rates. After this, we used the resulting equation to adjust the mean mortality rates within each category of ownership. The process of calculating adjusted group mean mortality rates removed compositional differences among the facilities. This provided a more accurate assessment of differences in mortality rates among the SNFs (6).

Results

Table 1 shows the means and standard deviations for the variables included in the analysis for all SNFs and for each ownership category. The means show considerable differences in mortality rates among the three ownership categories. Government-owned SNFs had the highest mortality rates, followed by nonprofits, and for-profits in that order.

For-profit SNFs reported a much higher percentage of discharges to a general hospital than either government-owned or nonprofit SNFs. They also had a higher percentage of Medicaid patients and a higher percentage of nonwhite patients.

The nonprofit SNFs reported a higher percentage of patients aged 85 years and older than either of the other two categories of facilities.

In terms of size as measured by the number of SNF beds, the nonprofits tended to be somewhat smaller on average than either the government-owned facilities or the for-profits. The three categories of SNFs had similar percentages of female patients and serious diagnoses, however.

Table 2 shows the results of the general linear model developed to explain differences in mortality rates. The parameter estimate for each variable in the model represents the amount of change in the mortality rate per unit change in that variable, controlling for all other variables in the model. The results indicated that the higher the percentage of female patients in the facility, the higher the mortality rate. Similarly, the more serious the diagnoses of the residents, based on our measure of severity, the higher the mortality rate.

The somewhat large and highly significant effect of discharges to a general hospital is of interest. The higher the percentage of discharges to a general hospital, the lower the facility's mortality rate. In fact, a 10 percent increase in discharges to a general hospital resulted in a decrease in the mortality rate of 1.06 per 100 residents.

Table 3 shows the mean mortality rates for each cate-

Table 2. Mortality rates from general linear model used in study of skilled nursing facilities in Illinois, 1986-87

Variable	Parameter estimate
Percent of patients female	¹ 0.0356
Percent of patients nonwhite	¹ -0.0390
Percent of patients on Medicaid	-0.0035
Percent of patients 85 years and older	0.0218
Percent of discharges to general hospital	² -0.1060
Percent of patients with serious diagnoses	¹ 0.0456
Type of ownership:	
Government	0.5604
Nonprofit	0.2549
Intercept	² 9.1313
R ²	0.281

¹0.05 ≤ *P* < 0.01. ²*P* ≤ 0.01.

Table 3. Comparison of unadjusted and adjusted mean mortality rates in study of skilled nursing facilities in Illinois, 1986-87

Ownership	Unadjusted	Adjusted
Government	13.79	11.68
Nonprofit	13.11	11.37
For-profit	9.81	11.12

gory of SNF ownership, adjusted for all variables in the model, as well as the unadjusted group means. After adjustment for the various differences among the three types of SNFs, the differences in mortality rates disappeared. That is, the mortality rates for the government-owned and the nonprofit facilities were higher than we would have expected if all SNFs had the same characteristics, whereas the rates for for-profit SNFs are considerably lower than would be expected.

The results lend support to the contention that for-profit facilities tend to discharge terminally ill patients to hospitals. In such cases, the patient dies there, resulting in lower mortality rates for the for-profit facilities.

Discussion

SNF mortality rates examined by type of ownership indicated that both the government-owned and nonprofit facilities had much higher mortality rates than the for-profit facilities. Such a finding might lead to the conclusion that the profit motivation of proprietary facilities ensures a higher level of care.

We had expected, because of possible differences in the characteristics of residents in different facilities and differing facility characteristics, that mortality rates would not vary by type of ownership. To assess the impact of the intervening variables on mortality rates, we employed a general linear model to obtain adjusted rates. The results showed that once facility and resident characteristics were controlled, the adjusted mortality

rates in fact did not differ by type of facility ownership.

Our results indicated that the risk of death in a SNF is neither higher nor lower in government-owned facilities, when other factors are taken into consideration. Further, we found that the lower unadjusted mortality rates for the proprietary facilities were because of, in large part, the discharging of seriously ill residents to general hospitals. Probable explanations for this discharge pattern include for-profit SNFs possibly having sicker residents than either nonprofits or the government-owned facilities. This explanation is not supported by our analysis, since for-profits did not appear to have significantly different scores on our measures of illness severity. A more detailed future examination of case mix differences at the individual patient level may help us determine the plausibility of this explanation.

A second explanation is that for-profit facilities are quicker to transfer residents to general hospitals in life threatening situations than other types of SNFs. Given our data, it is not possible to determine the plausibility of this explanation. Our analysis is based on cross-sectional data. Ingram and Barry (7) pointed out that longi-

tudinal studies may provide greater insight into the risk of death in SNFs. Our future work will be aimed at determining whether the lack of an ownership effect is part of an overall trend or whether it is simply an artifact of the year under investigation.

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Cognitive Laboratory Approach to Designing Questionnaires for Surveys of the Elderly

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Synopsis

Data from surveys of the elderly are used by policy analysts to design health services programs. Consequently, the quality of survey data on elderly respondents has important implications for this growing segment of society: improving the quality of data should result in more cost effective programs for the elderly.

However, studies suggest that the quality of responses from the elderly may be less than that for other respondents. Moreover, the increasing needs of policy analysts and health researchers for data have resulted in more complex survey questions that place a high cognitive burden on respondents. New methods for improving the design of these questionnaires are needed.

This project investigated whether new techniques of questionnaire design, adapted from the theories and methods of cognitive psychology, could be effectively used in interviewing older respondents. The techniques used in this study, concurrent think-aloud interviews with followup probe questions, have been shown recently to be effective with younger respondents.

Problems that elderly respondents have in comprehending survey questions, retrieving relevant information from memory, and using decision processes to estimate and provide answers were investigated. Questions on functional ability and social support were taken from the 1984 Supplement on Aging to the National Health Interview Survey.

Analysis of respondents' think-aloud protocols and responses to probes suggest that the cognitive interview procedures were effective in identifying problems with the survey questions that would result in data of poorer